Arc Reactor

Written By: Eric Weinhoffer

TOOLS:

- Helping hands (1)
- Rotary Tool (1)
- Soldering iron (1)
- Superglue (1)
- wire snips (1)

PARTS:

- LEDs (1)
- resistors (1)
- Battery (1)

SUMMARY

Instructions for making your own Arc Reactor, similar to what Tony Stark wears in Iron Man.

I'll give you a general idea of how I built it, along with how it's wired. Aside from the circuitry, this build is largely up to you, since I used a lot of scrap that I had lying around.
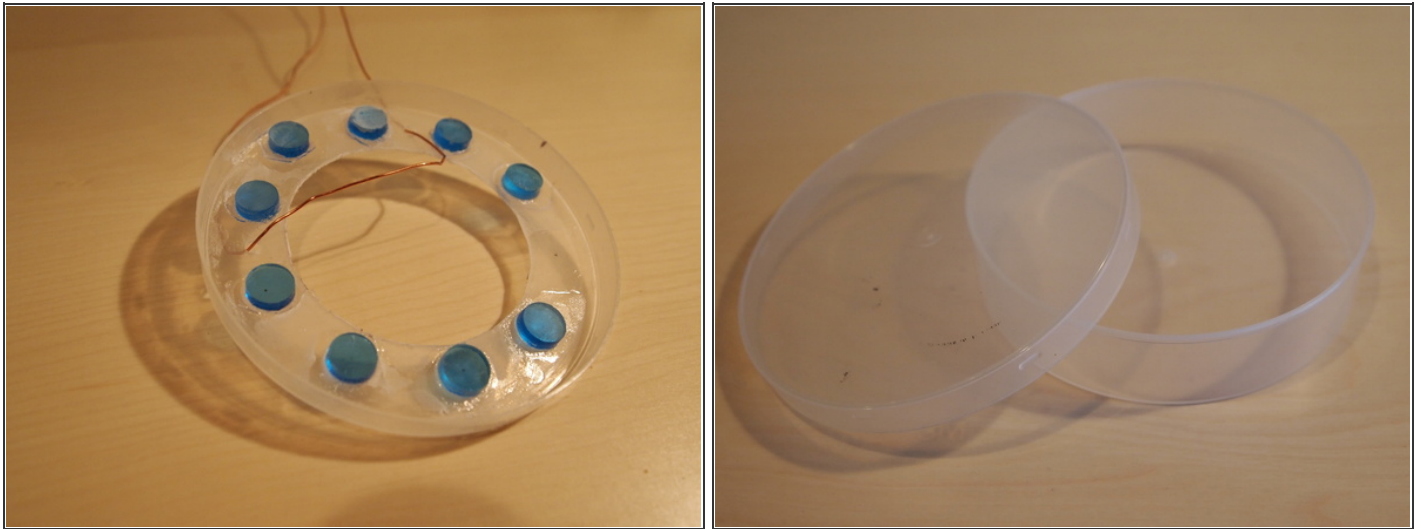
Be creative, and have fun!

Step 1 — Arc Reactor

- I was running out of time before Halloween, and decided to make a simple Arc Reactor to wear around my neck.

- This build is broken into three parts: the inner casing (which hangs around my neck), the outer casing, and the reactor itself.

Step 2

- The inner casing is simply the top of a plastic enclosure I received electrical tape in (Item # 76455A42 from [McMaster-Carr](#)).

- I glued a few 1/8" acrylic scrap pieces inside the casing to ensure that there wasn't too much play between the case and the reactor. I also attached a length of brass wire to the casing, which hangs around my neck.

  - With the inner casing around my neck, the reactor and outer casing are easy to remove and show off without having to take the whole assembly off my neck. Convenient!

- I used this plastic enclosure since it was around, but don't feel like you need to do the same. Be creative!

Step 3
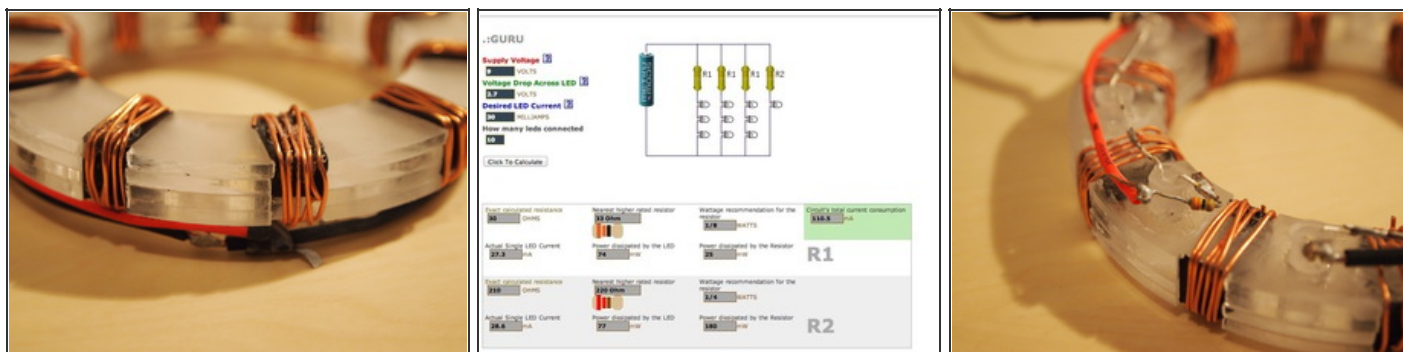
- The reactor is the most complex portion of the build, and the most important! Once you have your LEDs ready to go, you need to find out what their forward current and voltage are. You can usually find this from your LED distributor

  - I bought mine from Evil Mad Science, who list the specs on each product page.

- Next, use Ohm's Law (or a handy website like LEDcalc) to generate a schematic.

- My reactor's made up of four glued lasercut pieces of 1/8" acrylic, two of which have holes in them for the LEDs. I glued each LED in place before I began soldering, and was careful to keep the wiring organized.

  - I also sanded the two pieces of acrylic that the LEDs shine through, to diffuse the light.

- Now it's time to get creative and add decorative elements! I wrapped the reactor with black electrical tape and copper wire, holding everything together with lots of superglue.

Step 4
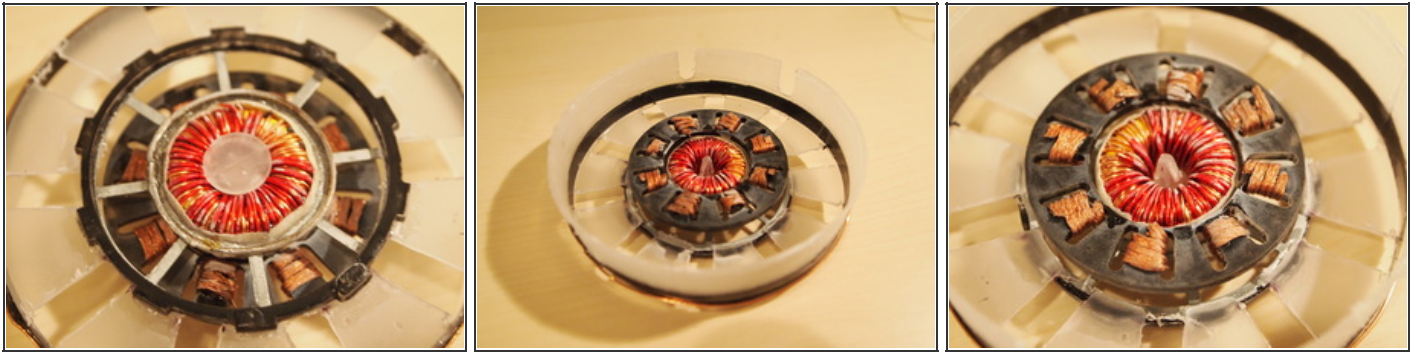
- I used the bottom part of the electrical tape enclosure for the outer casing. Using a cutoff wheel on my rotary tool, I cut a large hole in the center, ten slots to show off the copper wire sections of the reactor, and two slots on the side for the battery wires.

  - Many of the decorative elements used in the build were salvaged from a broken PC power supply. Superglue holds everything together!

  - I did take advantage of my access to a laser cutter once again here to cut the two black discs - the one on the backside of the casing has desoldering braid wrapped around its slots for a cool visual effect.

Step 5
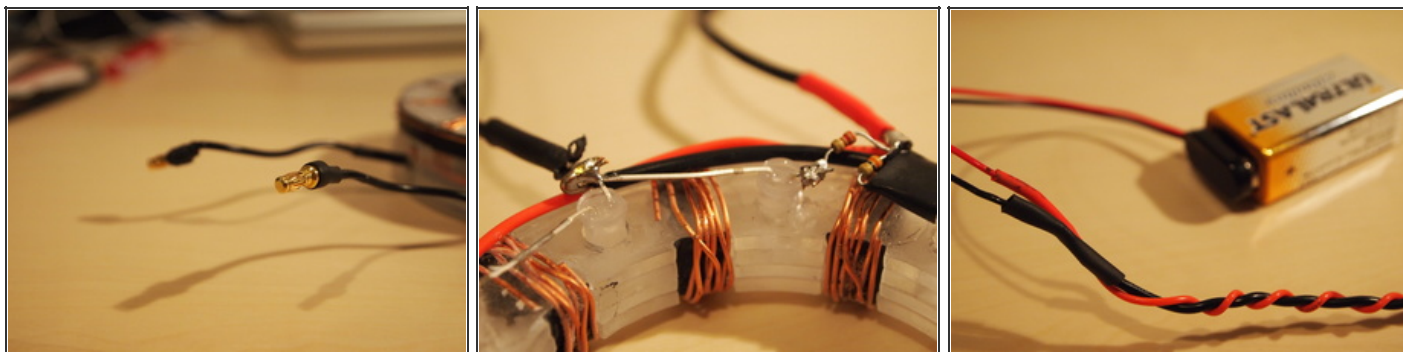
- The last step is to wire everything up and put it all together. I chose to use a 9V battery, which I could slip into my pocket, and two bullet connectors on the end so I could unplug at will.
- Use heatshrink tubing to secure the connections, if you have it, and electrical tape if you don't.
  - Also use two different colors of wire to distinguish between the power and ground leads on your circuit, so you can plug it in correctly every time.
- Coiling the two wires from the battery is definitely optional, but makes it easier to handle and looks cool.

Step 6

- Congrats, you're done! Insert the reactor into the outer casing and plug in your battery. Hang the inner casing around your neck, and snap everything together under your shirt.

The parts listed above are the only three that are absolutely required. I'd recommend using between 6 and 10 LEDs, and any combination of batteries.